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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/656,694	09/07/2000	Aravind Padmanabhan	9028/322(H16-26318)	2388

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EXAMINER	
EASTHOM, KARL D	

ART UNIT	PAPER NUMBER
2832	

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/656,694	PADMANABHAN ET AL.	
	Examiner	Art Unit	
	Karl D. Easthom	2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-11,13-16,19-32,35 and 36* is/are pending in the application.

4a) Of the above claim(s) *19-32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-11,13-16,35 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 7, and 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent basis for "first material" so that it is not clear what is meant.

3. Claims 1, 4-5, 8, 13 and 35-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Strott et al. Strott discloses the claimed invention at Fig. 1, with independent sensing elements 3, 12, 13 coupled to the front surface of insulating sensor body 4 having connection material 8,9 a plurality of openings thereof. With the element body being 2, bumps 8,9 extends from front to back, as noted at col. 4, lines 15-23, and lines 60-65. One of the sensors 3 is a heater. The continuous solid body includes portions of 4 below the sensors 2, because the body is flip mounted to an alumina substrate at col. 1, lines 30-36, and col. 2, lines 30-32, with the part 5 away from the alumina substrate. Thus the correction material is configured for connection to a substrate as disclosed at col. 1 of Strott. The device is a physical property sensor sense it senses heat from element 5, and is for monitoring properties of a fluid" since it can monitor heat from air hitting 5 or the thermistors 12 track ambient, monitoring heat from the fluid of the air or ambient. That is, the front surface of 4, where 3 is "interfaces" with the fluid where "interface" need not mean touching, but means ability to get heat from the heat transfer, similar to applicant's disclosure, where there is a cover 118 over the solid body and the solid body does not touch the fluid. The thermal

conductivity of 2 is low enough to substantially prohibit heat transfer between the plurality of heat sensors, as disclosed at col. 2, lines 34-40, since the thermistor 3 does not transfer heat to the thermistors 12, 13. Note too that the term "substantially" is one of degree as is "low" and moreover, each thermistors obtains its own temperature as noted at col. 5, lines 5-30, so that the sensor body, which is not perfect, does somewhat limit the heat flow. In claim 8, 4 is glass. In claim 5, the heater can be any of the sensors since resistors must heat. In claim 13, platinum is noted at the bottom of col. 1. In claims 14 and 36, there is no requirement that the body be of two different materials, so that the second material is the material not directly below the solid glass material, but to the side. In claim 35, the materials are substantially similar where the term is one of degree.

4. Claims 1, 4-5, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genova et al. in view of Nagai et al. (J4-83301). Genova discloses, except the openings, the claimed invention at Fig. 1 with sensor body 3 of glass, sensing elements 4, 7, one a heater. Nagai discloses vias with connection material at the abstract at Figs. 1-3 as equivalent to leads and used in order to form a connection to a back surface so that such would have been obvious for connection to another surface or substrate, where the IBTDB discloses a similar sensor and leads. For claims 4-5, the sensors meet the claim. For claims 35, substantially is broad and the device functions without breaking. For claim 36, the glass 3 is below.

5. Claims 1, 4, 5-11, 13-16, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBMTDB (NN79013227) in view of Nagai et al. (J4-83301) or

Genova et al., and Nukui et al. The IBMTDB discloses the claimed invention at the abstract and figure, except the openings, the glass, and connection material. Nagai discloses vias with connection material at the abstract at Figs. 1-3 as equivalent to leads and used in order to form a connection to a back surface so that such would have been obvious for connection to another surface or substrate, where the IBTDB discloses a similar sensor and leads. Genova discloses similar connections 28, disclosing at col. 5, lines 1-10 that such connections are desirable to reduce sensor to electronic gaps, and enable high density connections compatible with severe environments rendering the modification obvious. The heater and thermal sensor are noted at Fig. 2, the solid body is the Si-strip. Nukui discloses solid glass 2, and another material 3, under thermal sensors like that of Nagai, and discloses that the device can be used to sense a wide variety of flow rates, col. 3, lines 46-67. Similarly, Strott discloses glass 2 under typical sensors such as platinum for sensing ambient temperatures so that such materials would have been obvious, where they are more economical as noted at col. 1, lines 20-26. Also, glass is a known insulator, further suggesting replacing the insulators of the prior art[1]. For claims 1 and 14-15, it would have been obvious to substitute the structure surrounding the plug with the two layer material of Nukui such as mounting the chip of IBMTDB in the two layer material of Nukui, where Nukui discloses solid glass under thermal sensors like that of Nagai, and discloses that the device can be used to sense a wide variety of flow rates, col. 3, lines 46-67, and employs semiconductor processes like that of the IBMTDB, where each reference is

[1] See Websters' II, New Riverside Dictionary (1980), insulator is defined to include known materials like

concerned with sensing flow. For claim 6, the glass heats up with light or bends it. In claims 7,10, Nagai discloses an alumina substrate for a thermal sensor so that it would have been obvious to employ a known substrate to hold a thermal sensor, where Nukui discloses that any insulating material will suffice for glass. The Si substrate of the IBMTBD meets claim 9. For claims 4-5 the flow or environment is sensed via thermal sensing. In claim 8, the glass is highly melting where it melts either at a high temperature or melts easily. For claim 11, glass is known to be or contain silica, and glass is by definition fused[2]. In claims 14-15, there are two materials depicted in the IBMTDB, Si strip is one, as a plug, mounted in another material In claim 16, the Si plug is rectangular, but it would have been obvious to render any of a known standard geometrical shape such as a cylinder where Si chips are known to be frequently in cylinder form. In claim 33, "below" is met as the body is lower than some materials. In claim 35, "substantially similar" is met since the two function together without separation.

6. Claims 1, 4, 5, 8, 11, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. (J4-83301) in view of IBMTDB NN79013227, and either Nukui et al. or Strott. Nagai discloses the claimed invention, except the plurality of sensors and glass, at Fig. 2, with sensor body 1having openings and connection material 6, 8. The IBMTDB discloses the plural sensing elements including the heater and thermal sensor as noted above as the typical manner of sensing flow so that same would have been obvious where Nagai discloses a thermal sensor also. Col. 4, lines 1-

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glass.

18 of Nukui discloses solid glass under thermal sensors like that of Nagai, and discloses that any non-conductive material can be employed, so that it would have been obvious to replace the nonconductive alumina of Nagai, where each reference is concerned with sensing flow. Similarly, Strott discloses glass 2 under typical sensors such as platinum for sensing ambient temperatures so that such materials would have been obvious, where they are more economical as noted at col. 1, lines 20-26. See also note 1 where glass is a known insulator. Applicant also indicates at page 13 that it is well understood that a similar process can be used employing Pyrex, a glass.

7. Claims 1, 4-1 1, 13-16 , 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ang et al. in view of, either of Nagai et al. (J4-83301) or Genova et al., and either of Nukui or Strott. The claimed invention is disclosed as noted below, except the openings, glass, and connection material. The other elements are disclosed at Ang Figs. 1 and 3 with sensors 18, 20, 22, with 20, 18 a heater, substrate 24, 28 of silicon, and epoxy and glass material below same, see col. 2,1ines 55-70. Nagai discloses vias with connection material at the abstract at Figs. 1-3 as equivalent to leads and used in order to form a connection to a back surface so that such would have been obvious for connection to another surface or substrate, where the Ang discloses backside metal on the bottom of substrate 24, further suggesting such a connection. Genova discloses similar connections 28, disclosing at col. 5, lines 1-10 that such connections are desirable to reduce sensor to electronic gaps, and enable high density connections compatible with severe environments rendering the modification obvious.

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[2] See Websters' II, New Riverside Dictionary (1994), glass is typically made of silicon dioxide, aluminum

Col. 4, lines 1-18 of Nukui discloses solid glass under thermal sensors like that of Nagai, and discloses that any non-conductive material can be employed, so that it would have been obvious to replace the nonconductive glass and epoxy of Nagai with pure glass, where each reference is concerned with sensing flow and Ang discloses that the glass material should be mostly glass, col. 3, lines 5-10. Similarly, Strott discloses glass 2 under typical sensors such as platinum for sensing ambient temperatures so that such materials would have been obvious, where they are more economical as noted at col. 1, lines 20-26. See also note 1 where glass is a known insulator. Applicant also indicates at page 13 that it is well understood that a similar process can be used employing Pyrex, a glass. For claims 4-5, the sensors are as noted above. For claim 6, the glass is "photosensitive" since it will heat up with light, or bend light. For claim 7, the substrate 32 of Ang is ceramic so that it would have been obvious to employ same so that all materials are the same. In claims 8 and 9, highly melting and insulating are terms of degree deemed met by the materials noted. For claims 14 and 36, the glass is directly below as modified. For claim 15, the plug is the material 28 modified as glass, surrounded by the silicon or second material 24. For claims 7 and 10, a first ceramic material of alumina is noted at Nagai for supporting a thermistor so that employing same for the silicon substrate would have been obvious since it is a known support for a thermistor. For claims 8-9, and 11 glass melts at a high temperature, is known to contain silica, and silica is highly insulating silicon. Or for claims 9 and 11, the silicon chip of the IBMTDB includes silicon dioxide for protection

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oxide..

so that same would have been obvious as a first material For claim 13, as noted above, Strott at col. 1 discloses platinum as conventional and the materials inexpensive so that same would have been obvious. See alternatives below. Applicant also admits at page 13 that Pyrex is well known in the art for manufacturing glass components for the sensor arts so that it would have been obvious to employ that glass for the glass of Nukui or Strott. For claim 16, the plug is met by the material 28 where frustoconical is substantially cylindrical for claim 16. For claim 35, "substantial" is a broad term met else the device will fall apart with different coefficients, and the materials appear to be the same as that of applicant..

8. Claims 1, 4-11, 14-16, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBMTDB (NN79013227) or Ang et al. in view of Nagai et al. (14-83301) or Genova et al, as applied to claims above, further in view of Morimisa et al. The invention disclosed as noted above except the glass, and here photosensitive glass is explicitly suggested and disclosed to further provide motivation. That is, Morimisa discloses photosensitive glass and silica at col. 2 as useful substrate for thermal sensors to provide good response so that it would have been obvious to employ same for the substrate materials of the primary art. Further silica is fused since it must be fused to itself to be formed. Further, it is known that glass is an insulator, see note 1. Applicant also indicates at page 13 that it is well understood that a similar process can be used employing Pyrex, a glass.

9. Applicant's arguments filed 4/19/5 have been fully considered but they are moot, or persuasive only as to the removed rejections. Applicant argues that the Strott

thermal sensor does not have a front surface adapted to interface as claimed. This is not correct where interface does not required touching for reasons noted above. So the top surface of the body 4 is the surface that touches 2. It can "interface" with a fluid since heat transfers through that surface. This is similar to applicant's disclosure since his top surface has a cover 118 and does not touch the fluid. Even if element 5 and 2 are well insulated from the physical property, (and this is not correct since 5 is metal), since elements 12 and 13 can sense heat from the ambient, then each surface of 4 interfaces with the fluid. As to Morimissa, it is not material where the glass is, since the glass material is a well known insulator, and replaces insulators of the prior art. Applicant also indicates at page 13 that it is well understood that a similar process can be used employing Pyrex, a glass. See also note 1 where glass is a known insulator.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl D. Easthom whose telephone number is (571) 272-1989. The examiner can normally be reached on M-Th, 5:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karl D Easthom
Primary Examiner
Art Unit 2832

KDE